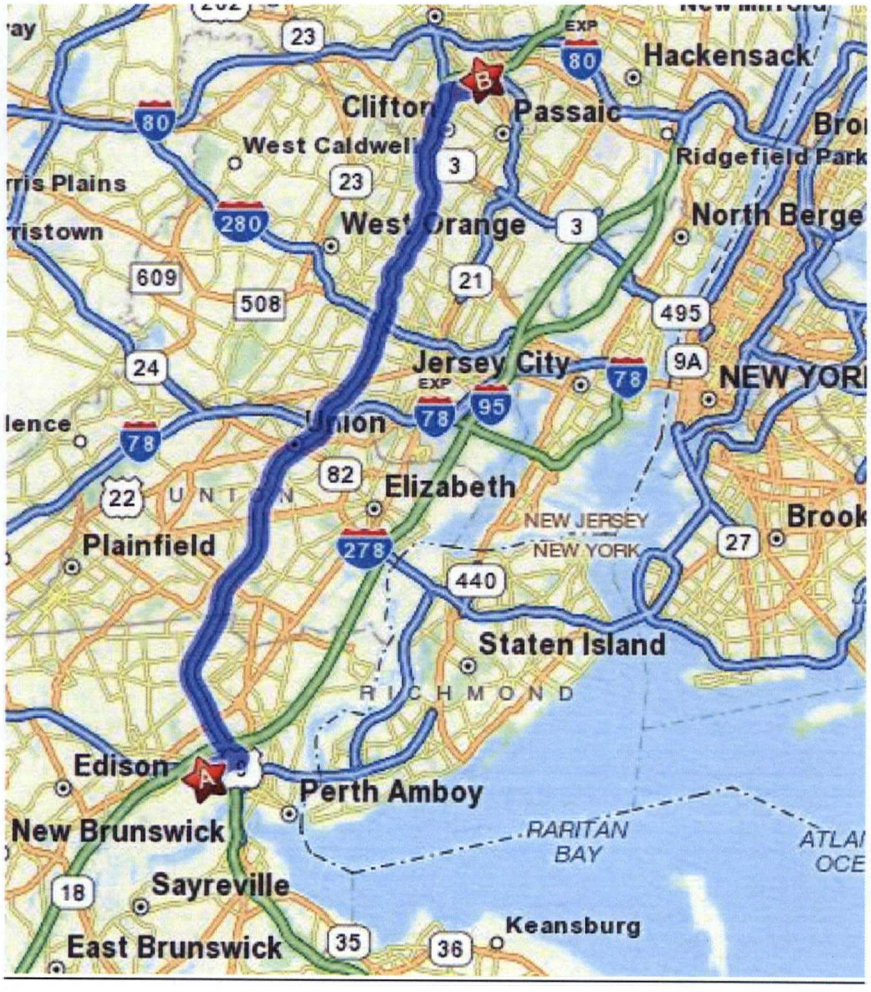
REGION II RST2 HEALTH AND SAFETY PLAN
EMERGENCY RESPONSE / REMOVAL ASSESSMENT
(1 January 2009)

TDD No. TO-0013-0129 **Site Name:** Heller Heat Treating Site

Site Address: Street No.: 5 Wellington St.
City: Clifton
County/State: Passaic County, New Jersey

Directions to Site:

1. Start at RST 2 office. (A)
2. Take Garden State Parkway North to Exit #154/Clifton onto US-46E.
3. Turn slight right onto Piaget Ave/CR-628.
4. Turn left onto Main Ave/CR-601.
5. Turn right onto Troast Ct.
6. Turn right onto Wellington St.
7. Arrive at 5 Wellington St. on the right. (B)



Historical/Current Site Information:

The Alfred Heller Heat Treating Company is a former heat treating and zinc plating/conversion coating facility located at 5 Wellington Street, Clifton, NJ. The Site is located in a densely populated area of Clifton, consisting of a mix of residential and light industry.

The Site is approximately four acres in size and contains six contiguous buildings with an approximate floor space of 75,000 square feet. The buildings contained two zinc electroplating lines, one zinc phosphate conversion coating line, and approximately 30 heat treating furnaces of various sizes. Included in the heat treating furnaces were three austemper furnaces; two of which contained an approximate total of 170 tons of molten sodium nitrite/nitrate at the time of initiation of the Removal Action. Additionally three of the heat treating furnaces contained approximately 2,000 gallons each of halogen-contained quench oils. Approximately 30,000 gallons of waste oil were contained both in the furnace reservoirs and in totes which were stored within the buildings. Trichloroethylene was used as a degreaser for some metal parts until the company switched to n-propyl bromide in the 1990s.

The Site also consists of two laboratories which contained various laboratory chemical containers including acids, bases, solvents and other chemicals. Approximately 596 drums of waste and/or product have been identified on-site since initiation of the Removal Action. Additionally, there were seven above-ground storage tanks and two underground storage tanks (USTs) located on the property. Some of the above-ground storage tanks have been removed from site.

Currently, EPA is in the process of conducting a Removal Action at this Site. Most of the wastes have been containerized for transportation and disposal.

RST 2 Scope of Work:

Currently, RST 2 has been tasked to provide oversite, drum sampling, air monitoring, and field screening support during the Removal Action.

Incident Type:
( ) Emergency Response -
( ) Removal Assessment –
(X) Removal Action – 11/16/09-TBD
( ) Residential Sampling / Investigation -
( ) PRP Oversight –
( ) Other -

Location Class: (X) Industrial ( ) Commercial (X) Urban/Residential ( ) Rural

U.S. EPA Contact: Chris D'Onofrio/Paul Kahn
Original HASP: Yes
Lead RST2: Sayed Iqbal

Date of Initial Site Activities: 11 / 16 / 09
Modification Number: 01
Site Health & Safety Coordinator: Sayed Iqbal
Health & Safety Alternate: TBD

Response Activities/Dates of Response

Emergency Response:

( ) Perimeter Recon.
( ) Site Entry
( ) Visual Documentation
( ) Multi-Media Sampling
( ) Decontamination

Removal Action:

(X) Perimeter Recon.: 11/16/09-TBD
(X) Site Entry: 11/16/09-TBD
(X) Visual Documentation: 11/16/09-TBD
(X) Multi-Media Sampling: 11/16/09-TBD
(X) Decontamination: 11/16/09-TBD

Physical Safety Hazards to Personnel

( ) Heat – *Attach FLD05*
(X) Precipitation - *Attach FLD02*
( ) Terrain - *Attach FLD11*
(X) Walking/Working Surfaces
( ) Oxygen Deficiency
( ) Overhead Utilities
(X) Unknowns in Drums, Tanks
( ) Waterways – *Attach FLD19*
( ) Illumination – *Attach FLD39*
( ) Nonionizing Radiation
( ) Elevated Work Surfaces - *Attach FLD24*
(X) Cold – *Attach FLD06*
( ) Confined Space
(X) Noise
(X) Fire & Explosion
( ) Underground Utilities– *Attach FLD34*
(X) Heavy Equipment – *Attach FLD22*
( ) Ponds, Lagoons, Impoundments
( ) Pressurized Containers, Systems - *Attach FLD16*
( ) Ionizing Radiation
( ) Excavations– *Attach FLD28*

Biological Hazards to Personnel

( ) Infectious/Medical/Hospital Waste (X) Non-domesticated Animals ( ) Insects
( ) Poisonous Plants/Vegetation ( ) Raw Sewage

Training Requirements

(X) 40 Hour General Site Worker Course with three days supervised experience
( ) 24 Hour Course for limited, specific tasks with one day supervised experience
(X) 8 Hour Annual Refresher Health and Safety Training
( ) 8 Hour Management/Supervisor Training in addition to basic training course
( ) Site Specific Health and Safety Training
( ) Pre-entry training for emergency response skilled support personnel

Medical Surveillance Requirements

(X) Baseline initial physical examination with physician certification
(X) Annual medical examination with physician certification
( ) Site Specific medical monitoring protocol (Radiation, Pesticides, PCBs, Metals)
( ) Asbestos Worker medical protocol
( ) Exempt from medical surveillance _____.
(X) Examination required in event of chemical exposure or trauma

Vehicle Use Assessment and Selection

Driving is one of the most hazardous and frequent activities for Weston Employees. As such, Weston Employees are required to adhere to established safe operating practices in order to maintain their eligibility to drive Weston owned, leased, or rented vehicles. Every person riding in a Weston vehicle, including passengers must maintain a commitment for a safe journey. This means being attentive while in the vehicle and helping the driver to notice hazards ahead of and around the vehicle and ensure that their presence does not distract the driver from safely operating the vehicle.

A high percentage of vehicle accidents occur when operating in reverse. Anytime a vehicle is operated in reverse, e.g., backing out of a parking area, if there are passengers, at least one of them are to assist the driver by acting as a guide person during the reverse movement or during other vehicle operation where it would be prudent to have a guide person(s) participate in the vehicle movement. When practical, the preferred parking method would be to back into the parking area.

At a minimum, each Weston Driver must:

- Possess a current, valid drivers' license
- Obey posted speed limits and other traffic laws
- Wear seat belts at all times while the vehicle is in operation
- Conduct a 360 degree inspection around the vehicle before attempting to drive the vehicle
- Report accidents / incidents immediately and complete a Notice of Incident (NOI)
- Keep vehicles on approved roadways (FWD doesn't guarantee mobility on unapproved surfaces)

All Region II RST 2 personnel are experienced and qualified to drive RST 2 fleet vehicles (Trailblazers, Suburbans, Cargo Van, and 10' x 12' Box Truck). However, in the event that vehicle rental is required, each person must take the time to familiarize themself with that particular vehicle. This familiarization includes adjustment of the dashboard knobs/controls, mirrors, steering wheel, seats, and a 360 degree external inspection of the vehicle.

1. The following vehicles are anticipated to be used on this project:

( ) Car
( ) Pickup Truck
( ) Intermediate / Standard SUV (e.g. Chevy Trailblazer, Chevy Tahoe, Jeep Liberty, Ford Explorer)
(X) Full Size SUV (e.g., Chevy Suburban, Ford Expedition, GMC Yukon)
( ) Minivan / Cargo Van
( ) Box Truck (Size:_____) or Emergency Response Vehicle (ERV)
( ) Other _____

2. Are there any on-site considerations that should be noted?

Yes, see below.

(X) Working/Driving Surfaces, ( ) Debris, (X) Overhead Clearance, ( ) Obstructions, ( ) Tire Puncture Hazards, ( ) Vegetation, ( ) Terrain, (X) Parking, ( ) Congestion, ( ) Site Entry/Exit Hazards, (X) Local Traffic Volume, (X) Security, (X) Heavy Equipment, ( ) Time/Length of Work Day

Do any of the considerations above require further explanation?
Vehicles need to be parked in a marked parking area to avoid heavy equipment.

3. Are there any seasonal considerations that should be noted (e.g., Anticipated Snowy Conditions)?

None.

4. Is a Traffic Control Plan required? ( ) Yes / (X) No.
   If so, the Traffic Control Plan must be attached to this Health & Safety Plan.

Chemical Hazards to Personnel

Physical Parameters	Chemical Contaminant Zinc Oxide (ZnO)	Chemical Contaminant Hydrogen Chloride (HCl)	Chemical Contaminant Trichloroethylene (TCE)
Exposure Limits IDLH Level	___ ppm 5 mg/m³ PEL ___ ppm 5 mg/m³ REL ___ ppm 500 mg/m³ IDLH	5 ppm 7 mg/m³ PEL 5 ppm 7 mg/m³ REL 50 ppm ___ mg/m³ IDLH	100 ppm 537 mg/m³ PEL 25 (10 hour) ppm ___ mg/m³ REL Ca 1000 ppm ___ mg/m³ IDLH
Physical Form (Solid/Liquid/Gas) Color	X Solid ___ Liquid ___ Gas White Color	___ Solid ___ Liquid X Gas Colorless to slightly yellow Color	___ Solid X Liquid ___ Gas Colorless unless dyed blue Color
Odor	Odorless	Pungent, irritating odor	Chloroform-like odor
Flash Point Flammable Limits	NA Degrees F or C NA % UEL NA % LEL	NA Degrees F or C NA % UEL NA % LEL	? Degrees F or C 10.5 % UEL 8 % LEL
Vapor Pressure Vapor Density	0 mm/Hg - - Air = 1	40.5 atm 1.27 Air = 1	58 mm/Hg - - Air = 1
Specific Gravity	5.61 Water = 1	- - Water = 1	1.46 Water = 1
Solubility	0.0004%	67%	0.1%
Incompatible Material	Chlorinated rubber (at 419°F), water	Hydroxides, amines, alkalis, copper, brass, zinc	Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium, & beryllium)
Routes of Exposure	X Inh ___ Abs ___ Con ___ Ing	X Inh ___ Abs X Con X Ing	X Inh X Abs X Con X Ing
Symptoms of Acute Exposure	Metal fume fever: chills, muscle aches, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; lower back pain; vomit; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function	Irritation nose, throat, larynx; cough, choking; dermatitis; solution: eye, skin burns; liquid: frostbite; in animals: laryngeal spasm; pulmonary edema	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomit; dermitis; cardiac arrhythmias, paresthesia; liver injury; potential occupational carcinogen
First Aid Treatment	Breathing: Respiratory support	Eye: Irrigate immediately (solution)/Frostbite Skin: Water flush immediately (solution)/Frostbite Breathing: Respiratory support Swallow: Medical attention immediately (solution)	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately
Ionization Potential	NA eV	12.74 eV	9.45 eV
Instruments for Detection	___ PID w/ ___ Probe ___ FID ___ CGI ___ RAD ___ Det Tube ___ pH Other NIOSH 7303, 7502	___ PID w/ ___ Probe ___ FID ___ CGI ___ RAD X Det Tube X pH Other NIOSH 7903	X PID w/ 10.6 Probe X FID X CGI ___ RAD ___ Det Tube ___ pH Other NIOSH 1022, 3800

Chemical Hazards to Personnel

Physical Parameters	Chemical Contaminant Sodium Hydroxide (NaOH)	Chemical Contaminant Sodium Nitrite	Chemical Contaminant Ammonia (NH_3)
Exposure Limits IDLH Level	___ ppm 2 mg/m³ PEL ___ ppm 2 (ceiling) mg/m³ REL ___ ppm 10 mg/m³ IDLH	Not Listed PEL Not Listed REL Not Listed IDLH	50 ppm ___ mg/m³ PEL 25 ppm 18 mg/m³ REL 300 ppm ___ mg/m³ IDLH
Physical Form (Solid/Liquid/Gas) Color	X Solid ___ Liquid ___ Gas Colorless to white Color	X Solid ___ Liquid ___ Gas Yellowish white Color	___ Solid ___ Liquid X Gas Colorless Color
Odor	Odorless	Odorless	Pungent, suffocating odor
Flash Point Flammable Limits	NA Degrees F or C NA % UEL NA % LEL	NA Degrees F or C NA % UEL NA % LEL	NA Degrees F or C 28 % UEL 15 % LEL
Vapor Pressure Vapor Density	0 mm/Hg - - Air = 1	NA mm/Hg - - Air = 1	8.5 atm 0.60 Air = 1
Specific Gravity	2.13 Water = 1	2.17 Water = 1	- - Water = 1
Solubility	111%	%	34%
Incompatible Material	Water; acids; flammable liquids; organic halogens; metals such as aluminum, tin & zinc; nitromethane	Phosphorus, tin(II) chloride or other educing agents; ammonium compounds; acids; liquid ammonia; ammonium salt	Strong oxidizers, acids, halogens, salts of silver and zinc
Routes of Exposure	X Inh ___ Abs X Con X Ing	X Inh ___ Abs X Con X Ing	X Inh X Abs X Con X Ing
Symptoms of Acute Exposure	Irritation eyes, skin, mucus membrane; pneumonitis; eye, skin burns; temporary loss of hair	Irritation eyes, nose, throat, skin; headache, difficulty breathing, loss of consciousness; nausea, vomiting	Irritation eyes, nose, throat, dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin burns, vesiculation; liquid: frostbite
First Aid Treatment	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately	Eye: Irrigate immediately (solution/liquid) Skin: Water flush immediately (solution/liquid) Breathing: Respiratory support Swallow: Medical attention immediately (solution)
Ionization Potential	NA eV	___ eV	10.18 eV
Instruments for Detection	___ PID w/ ___ Probe ___ FID ___ CGI ___ RAD ___ Det Tube ___ pH Other NIOSH 7401	___ PID w/ ___ Probe ___ FID ___ CGI ___ RAD ___ Det Tube ___ pH Other	X PID w/ 10.6 Probe ___ FID ___ CGI ___ RAD X Det Tube ___ pH Other NIOSH 0500

Control Measures

Site Map:

Work Zone Definitions:

Exclusion Zone - the area where contamination is either known or expected to occur and the greatest potential for exposure exists. The outer boundary of the Exclusion Zone, called the Hotline, separates the area of contamination from the rest of the site.

Contamination Reduction Zone (CRZ) - the area in which decontamination procedures take place. The purpose of the CRZ is to reduce the possibility that the Support Zone will become contaminated or affected by the site hazards.

Support Zone - the uncontaminated area where workers are unlikely to be exposed to hazardous substances or dangerous conditions. The Support Zone is the appropriate location for the command post, medical station, equipment and supply center, field laboratory, and any other administrative or support functions that are necessary to keep site operations running efficiently.

Communications:

(X) Buddy System ( ) Radio ( ) Air Horn for emergencies
(X) Hand Signals (X) Visual Contact

Personnel Decontamination Procedures:

( ) Wet Decontamination (procedures as follows)
(X) Dry Decontamination (procedures as follows)

Used PPE will be cleaned on-site of gross contamination and be disposed of as part of the Removal Action.

Equipment Decontamination Procedures:

(X) None
( ) Wet Decontamination (procedures as follows)
( ) Dry Decontamination (procedures as follows)

Only dedicated, disposable equipment will be used on Site.

Adequacy of decontamination determined by: Site Health and Safety Officer

Personal Protective Equipment

TASK TO BE PERFORMED	ANTICIPATED LEVEL OF PROTECTION	TYPE OF CHEMICAL PROTECTIVE COVERALL	INNER GLOVE OUTER GLOVE BOOT COVER	TYPE OF APR CARTRIDGE OR CANISTER
Opening Unknown Drums/ Sample Collection from Unknown Drums	B	Saranex	Blue Nitrile/Green Nitrile/Latex Booties	SCBA
Field Screening/ Drum Staging	C	Saranex	Blue Nitrile/Blue Nitrile/Latex Booties	General P-100 Cartridges
Documentation/ Oversight	D	Cotton Coveralls	Blue Nitrile/Blue Nitrile/ Latex Booties	None

Frequency and Types of Air Monitoring: ( ) Continuous ( ) Routine - _____ ( ) Periodic -

DIRECT READING INSTRUMENTS	**MultiRAE** CGI/O2-H2S-CO-PHOTO IONIZATION DETECTOR	**Ludlum 19** Micro-R Meter/**Ludlum Model 3** Survey Meter/Probe	**Photovac** MicroFID	**Drager** Chemical Detector Tube	OTHER
ID NUMBER					
CALIBRATION DATE					
RST MEMBER					
ACTION LEVEL	≥ 10 - 20% LEL (ConfinedSpace/non-ConfinedSpace) ≤ 19.5%, O_2 Deficient ≥ 23% O_2 - Enriched	3X BACKGROUND - CAUTION; 1 mR/HR - LEAVE	UNKNOWNS: 1 - 5 UNITS - "C" 5-500 UNITS-"B"	PEL/TLV COMPARE WITH RESPONSE OF TUBE	

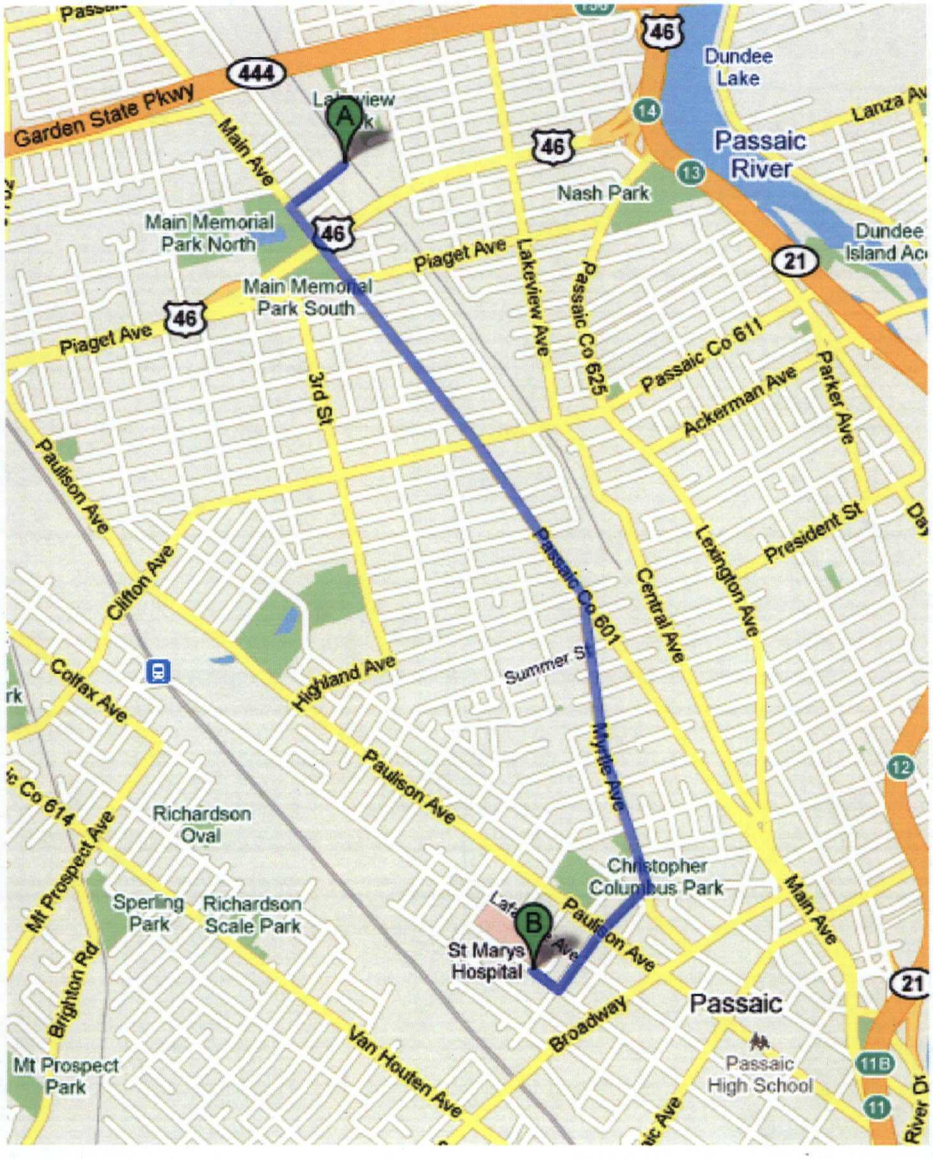
Emergency Telephone Numbers

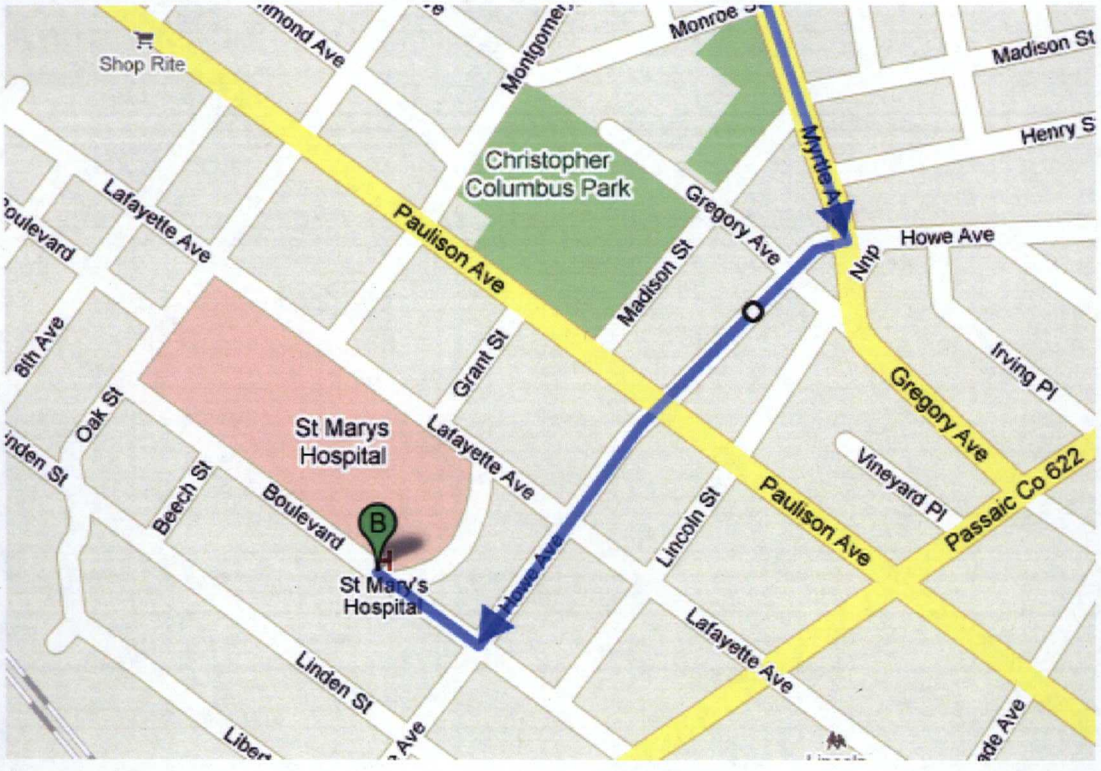
Emergency Contact	Location	Phone Number	Notified
Hospital: St. Mary's Hospital	350 Boulevard Passaic, NJ 07055	(973) 365-4300	No
Ambulance: Clifton Fire Department	900 Clifton Ave. Clifton, NJ	(973) 470-5801 or 911	No
Police: Clifton Police Department	900 Clifton Ave. Clifton, NJ	(973) 470-5900 or 911	No
Fire Department: Clifton Fire Department	900 Clifton Ave. Clifton, NJ	(973) 470-5801 or 911	No

Chemical Trauma Capability? (X) Yes ( ) No

Directions to Hospital:

1. Head southwest on Wellington St toward Getty Ave.
2. Turn Left at Main Ave/Passaic Co 601.
3. Slight Right at Myrtle Ave.
4. Turn Right onto Howe Ave.
5. Turn Right onto Boulevard.
6. Arrive at 350 Boulevard, Passiac, NJ, St. Mary's Hospital.





Route verified by: _____ Date: __/__/

Additional Emergency Phone Contacts

WESTON Medical Emergency Service (Dr. Patrice Marshall, Medical Director)	800-874-4676 (Regular Business Hours)
Chemtrec	800-424-9300
ATSDR	404-639-0615
ATF (explosives information)	800-424-9555
National Response Center	800-424-8802
National Poison Control Center	800-764-7661
Chemtel	800-255-3924
DOT	800-424-8802
CDC	800-232-0124

HASP prepared by: Joel Petty Date: 11 / 13 / 2009
Pre-Response/Entry Approval by: _____ Date: 11 / 13 / 2009
Verbal Approval/Modification to Original HASP by: _____ Date: __/__/

Description of Site and Response Activities

Size of Site: Approx. 75,000 sq. feet Terrain: ____ Weather:_____

Evacuation: ( ) Yes ( ) No By Whom:_____

Condition	Observed	Potential	None	Comments/Observations
Surface Water Contamination				
Ground Water Contamination				
Drinking Water Contamination				
Air Release				
Soil Contamination				
Stressed Vegetation				
Dead Animal Species				

Action Taken On-Site:

Perimeter Monitoring:( ) Yes ( ) No
Site entry by RST2: ( ) Yes ( ) No

Tasks Conducted	**Level of Protection/Specific PPE Used**

Hazardous Waste Site and Environmental Sampling Activities

Off Site: ( ) Yes (X) No
On Site: (X) Yes ( ) No

Describe types off samples and methods used to obtain samples: RST 2 may be required to collect samples from drums (both liquids and solids).

Was laboratory notified of potential hazard level of samples? ( ) Yes (X) No

Note: The nature of the work assignment may require the use of the following procedures/programs which will be included as attachments to this HASP as applicable: Emergency Response Plan, Confined Space entry Procedures, Spill Containment Program.

Disclaimer: This Health and Safety Plan (HASP) was prepared for work to be conducted under the Removal Support Team 2 (RST2) Contract EP-W-06-072. Use of this HASP by WESTON and its subcontractors is intended to fulfill the OSHA requirements found in 29 CFR 1910.120. Items not specifically covered in this HASP are included by reference to 29 CFR 1910 and 1926.

The signatures below indicate that the individuals have read and understood this Health and Safety Plan.

PRINTED NAME	SIGNATURE	AFFILIATION	DATE
SAYES IQBAL		Weston/RST 2	11/16/09
CRIS DONOFRIO		EPA	11/12/2009
Jeff JAGER		Weston RST2	12/09/09
Sean Sarles		Weston/RST2	12/10/09
Sandra Richards	Sandra Richards	Weston/ RST 2	12/14/2009
Joel Petty	Joel Petty	Weston/RST2	12/14/09

Final Submission of HASP by:		Date
Post Response Review by:		
Post Response Approval by:		
RST2 HSO Review by:		

COMMENTS/FOLLOW UP

Air Monitoring Summary Log

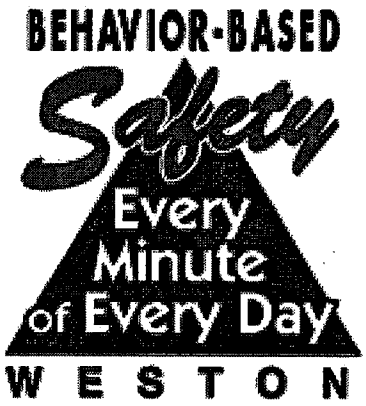
Date: __/__/
Data Collected by:

Station/Location	CGI/O_2 Meter	Radiation Meter	PID	FID	Other (_____)

Summary/Comments (data to be summarized by a range of readings, i.e. "Low to High" and/or "Average" by location):

ATTACHMENT A

CORPORATE ENVIRONMENTAL COMPLIANCE HEALTH AND SAFETY PROGRAM – CHAPTER 7: OCCUPATIONAL NOISE AND HEARING CONSERVATION PROGRAM



Weston Solutions, Inc.
Corporate Environmental Compliance, Health, and Safety Program

Owen B. Douglass, Jr., Ph.D., CIH
Director, Corporate Environmental Health & Safety

Raymond J. Griffin
Senior Vice President
Human Resources, Environmental Health & Safety, Security

April 2008

WESTON SOLUTIONS

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

7.0 OCCUPATIONAL NOISE AND HEARING CONSERVATION PROGRAM

Noise can cause sudden traumatic temporary or permanent hearing loss, long-term slowly occurring sensory-neural and irreversible hearing loss, disruption of communication, and masking of warning devices and alarms. Additional concerns include increased stress levels and effects on the cardiovascular and nervous systems. This Program describes the process for controlling, reducing, and minimizing noise exposure.

WESTON's OMP will assist in compliance with this Program through evaluation of clinics, verification of baseline exams, and employee audiogram evaluation. The OMP will advise the appropriate Safety Officer and, if necessary, the CEH&S Director of any problems associated with medical compliance or occupationally related hearing loss in workers.

The need for noise-monitoring equipment, noise dosimeters or hearing protection devices must be addressed in the planning stages of a project. Some of the sources of noise at hazardous materials sites, demolition operations, construction and industrial sites which can cause hearing damage are: earth moving equipment (front end loader, bull dozer), material handling equipment (cranes, industrial trucks), power units (compressors, generators drill rig engines), impact devices (pile drivers, chipping hammers), and other powered devices (saws, needle guns, drills, vibrating equipment).

7.1 NOISE EVALUATION AND SURVEILLANCE PROCEDURES

OSHA in 29 CFR 1910.95, establishes a PEL, time weighted average (TWA) of 90 dBA for an 8-hour work day and a TWA of 85 dBA as the trigger point (action level or AL) for establishing a Hearing Conservation Program (HCP). The HCP includes baseline and annual hearing tests, and hearing conservation training.

Noise exposure can also be compared to the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV). The TLVs for noise are arranged in a scale in dBs related to time periods. For an 8-hour work period the TWA TLV is 85 dBA, and the AL is 80 dBA. The ACGIH numbers are more conservative and realistically reflect current scientific knowledge on the human effects from noise exposure. Therefore, WESTON will use the ACGIH TLVs and Guidance and the 3 dB exchange rate as the basis for WESTON's HCP to provide a higher level of protection for our employees than that offered by compliance with the OSHA requirements which are several dB higher.

Noise exposure assessment is performed only by qualified personnel with properly calibrated and functional noise measuring equipment. If the HASP or the FSO indicates that the site, or activity, requires an instrumentation survey then the area will be screened with an A-weighted sound level meter (Area Monitoring). If deemed necessary a more in depth evaluation utilizing a noise dosimeter may be performed (Personnel Monitoring). Both types of monitoring, if needed, will be accomplished in accordance with requirements established in 29 CFR 1910.95(d).

In the absence of sound level measuring instrumentation, any noise preventing normal vocal discussion between two individuals at arms length distance ("arms-length rule") will dictate the need for hearing protection. WESTON guidelines require the use of hearing protection on an immediate basis under the "arms-length rule". Exceptions may be granted based upon evaluation of a specific task and duration with consultation with an industrial hygienist.

Long-term work efforts at fixed locations (e.g., water treatment plants, incinerators) require an evaluation of noise levels. Re-monitoring may be necessary when changes in equipment, processes, or activities result in modification of the noise level.

If impact noise is present, the peak noise levels and the frequency of the impacts should be determined. OSHA and AGCIH recommendations and/or qualified personnel should be consulted if questions arise regarding impact or impulse noise.

7.2 NOISE CONTROL METHODS

Engineering Controls

The primary means of reducing or eliminating personnel exposure to noise is through engineering controls. Engineering controls are defined as any modification or replacement of equipment, or related physical change at the noise source or along the sound transmission path that will reduce the noise level to the employee's ear. Engineering controls include items such as; mufflers on heavy equipment or motors, sound baffles, and enclosures.

Administrative Controls

Administrative controls may include changes in the work schedule or operations to reduce noise exposure, increasing worker distance from the noise source, and rotation of jobs to reduce time limits of exposure. Administrative time control is not a preferable method for preventing noise exposure since extreme noise for a short duration can cause severe, permanent hearing loss. Administrative controls may be utilized in accordance with the TLV Table ACGIH TLVs and Biological Exposure Indices (BEIs), 2007 Edition. Administrative controls may not be utilized for exposures greater than 100 dBA, regardless of the exposure time.

Hearing Protection

Hearing protection devices are utilized whenever engineering controls prove to be infeasible or cost prohibitive. Various types of ear muffs and ear plugs are available. Hearing protector attenuation is intended to reduce employee exposures below 80 dBA for employees with standard threshold shifts and below 85 dBA for all other employees.

WESTON personnel and WESTON subcontractors must wear hearing protection devices (HPDs) when required and where signs are posted requiring their use. Hearing protection devices are strongly recommended in any noisy environment, but are mandatory in the following situations:

- The 8-hour average may equal or exceed 85 dBs.
- Any employee exposed to greater than or equal to 85 dBs and who have experienced a standard threshold shift in their hearing.
- Any noise equal to greater than 100 dBs impact, continuous or intermittent.
- Anywhere a "HEARING PROTECTION REQUIRED" sign is posted. These signs are to be posted in all mandatory situations listed above.

In addition when noise levels equal or exceed 80 dBA employees must have:

- Availability of hearing protectors.
- Information and training on effects of noise.
- Availability of audiometric testing where there is a risk to health.

Not all hearing protection devices have the same noise reduction rating (NRR). Verification of all NRR values must be made by referring to the manufacturers' specifications. The proper hearing protection is selected using results from a properly calibrated sound level meter in accordance with ACGIH TLVs and BEIs, 2007 Edition.

Additional information regarding the selection, use, maintenance, and control of hearing protection devices is provided in the WESTON Personal Protective Equipment Program (Section 5.0).

NRR will be adjusted using the following to estimate the attenuation afforded to a noise-exposed employee in a work environment by muffs, plugs, or a combination of both:

Single Protection

A common formula used to estimate exposure for **single protection** (either muffs or plugs) follows:

1. Determine the laboratory-based noise attenuation provided by the HPD. This is referred to as the NRR and is listed on the packaging.
2. Subtract the NRR from the C-weighted TWA workplace noise level, as follows:

   Estimated Exposure (dBA) = TWA (dBC) - NRR

If C-weighted noise level data are not available, A-weighted data can be used by subtracting a 7 dB correction factor from the NRR, as follows:

Estimated Exposure (dBA) = TWA (dBA) - (NRR - 7)

Example:

TWA=100 dBA, muff NRR=19 dB

Estimated Exposure = 100 - (19-7) = 88 dBA

Dual Protection

A common formula used to estimate exposure for **dual protection** (ear muffs and plugs are used simultaneously) follows:

1. Determine the laboratory-based NRR for the **higher** rated protector (NRR_h).
2. Subtract 7 dB from NRR_h if using A-weighted sound level data.
3. Add 5 dB to the field-adjusted NRR to account for the use of the second hearing protector.
4. Subtract the remainder from the TWA as follows:

   Estimated Exposure (dBA) = TWA (dBC) - (NRR_h + 5) or

   Estimated Exposure (dBA) = TWA (dBA) - [(NRR_h - 7) + 5]

   Example:

   TWA=110 dBA, plug NRR=29, and muff NRR=25 dB

   Estimated Exposure = 110 - [(29 - 7) + 5] = 83 dBA

ATTACHMENT B

FLD 02 – INCLEMENT WEATHER

FLD 02 INCLEMENT WEATHER

Hot weather (ambient temperatures over 70°F), cold weather (ambient temperatures below 40°F), rain, snow, ice, and lightning are examples of inclement weather that may be hazardous or add risk to work activities. Extremes of heat, cold, and humidity, as well as rain, snow, and ice, can adversely affect monitoring instrument response and reliability, respiratory protection performance, and chemical protective clothing materials.

RELATED FLDs AND OP

FLD 05 – Heat Stress Prevention and Monitoring
FLD 06 – Cold Stress
OP 05-03-008 – Inclement Weather & Business Disruption Policy

PROCEDURE

The potential for exacerbating the impact of physical hazards must be considered for tasks that expose personnel to inclement weather. Risk assessment and hazards analysis should be accomplished during the planning stages of a project for the most likely inclement weather conditions that may be encountered, i.e., rain and lightning in late spring, summer, and early fall, or lightning prone areas; cold, snow, and ice in winter. The Field Safety Officer (FSO) must determine the proper safety procedures and recommend them to the site manager. Each worker must evaluate the risk associated with his/her work and be actively alert to these hazards. Managers and workers must be familiar with the requirements of FLD 05 and FLD 06.

A pre-site activity risk assessment must be completed when inclement weather occurs. Weather conditions that affect instruments and personal protective equipment (PPE) function must be conveyed to site workers who should monitor function and integrity of PPE and be alert to changing weather conditions. A decision must be made on the proper safety procedures to use if work must continue, or to stop work if the risk is too great. The appropriate Safety Professional **must be notified of all instances of the need to stop work for safety reasons, including inclement weather**.

Heat

Hot, dry weather increases risk of soil drying, erosion, and dust dispersion, which may present or increase risk of exposure and environmental impact from toxic hazards. Hot weather will increase pressure on closed containers and the rate of volatilization, thereby potentially increasing the risk of exposure to toxic, flammable, or explosive atmospheres.

Prevention and Protective Measures

Employees must be protected from airborne contaminants using engineering controls such as wetting dry soil to prevent particle dispersion, and providing local ventilation to reduce volatile air contaminants to safe levels, or if engineering controls are infeasible, using prescribed PPE. Wind shifts and velocity should be measured where change may result in dispersion of airborne contaminants into the work area.

Rain, Wet Weather, and High Humidity

Wet conditions resulting from rain and wet weather increase slipping and tripping hazards, braking distances of vehicles, the potential for vehicle skidding, or difficulties in handling powered devices such as augers and drills. Rain fills holes, obscures trip and fall hazards, and increases risk of electrical shock

when working with electrical equipment. Changes in soil conditions caused by rain can impact trenching and excavating activities, creating the potential for quicksand formation, wall collapse, and cave-in. Vehicles become stuck in mud, and tools and personnel can slip on wet surfaces. Rain and wet conditions may decrease visibility (especially for personnel wearing respiratory protection) and limit the effectiveness of certain direct-reading instruments (e.g., photoionization detectors [PIDs]).

Feet that become wet and are allowed to remain wet can lead to serious problems under both heat and cold conditions. Activities that may result in wet feet include extended work in chemical protective clothing and wading in water/liquid during biological assessments. Trench foot, paddy foot, and immersion foot are terms associated with foot ailments resulting from feet being wet for long periods of time. All have similar symptoms and effects. Initial symptoms include edema (swelling), tingling, itching, and severe pain. These may be followed by more severe symptoms including blistering, death of skin tissue, and ulceration. (NOTE: The following Preventive and Protective Measures also apply to Cold, Snow, and Ice.)

Preventive and Protective Measures

Walkways, stairs, ladders, elevated workplaces, and scaffold platforms must be kept free of mud, ice, and snow. Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.

Vehicles used in rain or cold weather must have working windshield wipers and defrosters, and windows must be kept clear of obstruction.

Drivers must observe traffic laws, including maintaining speed within limits safe for weather conditions, and wearing seat belts at all times. Note that this may mean operating below the posted speed limit.

When walking, workers should use a walking stick or probe to test footing ahead where there is standing water, snow, or ice to protect the walker against stepping into potholes or onto puncture hazards, buried containers, or other potential structurally unsound surfaces.

Prior to using vehicles or equipment in off-road work, workers should walk the work area or intended travelway when puddles or snow may obscure potholes, puncture hazards, or buried containers, or other potential structurally unsound surfaces.

Project managers should arrange to have winches, come-alongs, or other mechanical assistance available when vehicles are used in areas where there is increased risk of getting stuck. Cable or rope and mechanical equipment used for pulling stuck vehicles must be designed for the purpose, of sufficient capacity for the load, and be inspected regularly and before use to ensure safety. **Manually pushing stuck vehicles is to be avoided.**

Prevention methods are required when work is performed in wet conditions or when conditions result in sweating, causing the feet to become and remain wet. Proper hygiene is critical. Workers must dry their feet and change socks regularly to avoid conditions associated with wet feet. Use of foot talc or powder can additionally assist in prevention of this type of condition.

Cold, Snow, and Ice

Cold weather affects vehicle operation by increasing difficulty in starting and braking. Ice, frost, and snow can accumulate on windows and reduce vision. Cold, wet weather can cause icing of roadways,

driveways, parking areas, general work places, ladders, stairs, and platforms. Ice is not always as obvious to see as snow or rain, and requires special attention, especially when driving or walking.

Snow and ice increase the risk of accidents such as slipping when walking, climbing steps and ladders, or working at elevation, and the risk of accidents when driving vehicles or operating heavy equipment. Heavy snow and ice storms may cause electric lines to sag or break, and the use of electrical equipment in snow increases the risk of electric shock. Snow can hide potholes and mud, which can result in vehicles getting stuck or persons falling when stepping into hidden holes. Snow also may cover water, drums or other containers, sharp metal objects, debris, or other objects that can cause falls or punctures.

Preventive and Protective Measures

WESTON personnel are cautioned against operating motor vehicles such as cars or trucks on ice under any circumstances. If traveling in icy conditions, WESTON personnel should follow all public service advisories that curtail driving activities.

Personnel performing activities that require working over ice should be aware of minimal ice thickness safety guidelines as follows:

- 4-inch minimum: activities such as walking or skating.
- 6-inch minimum: activities such as snowmobiling or the use of equipment with the same weight and cross-sectional area as a snowmobile.

Personnel should always be aware that these measurement guidelines are under ideal conditions and that snow cover, conditions on rivers, ponds, or lakes with active currents, and other environmental factors impact the safety of working on ice. Clear ice typically is the strongest, while ice that appears cloudy or honeycombed (contains entrained air) is not as structurally strong. Measurements made by drilling or cutting through the ice should be made every few feet to verify safe conditions. Provisions for rescue (e.g., ladders or long poles and effective communications) must be available at the work site.

Lightning

Lightning represents a hazard of electrical shock that is increased when working in flat open spaces, elevated work places, or near tall structures or equipment such as stacks, radio towers, and drill rigs. Lightning has caused chemical storage tank fires and grass or forest fires. Static charges associated with nearby electrical storms can increase risk of fire or explosion when working around flammable materials, and can adversely affect monitoring instruments.

Lightning is the most dangerous and frequently encountered weather hazard people experience each year. Lightning affects all regions. **Florida, Michigan, Pennsylvania, North Carolina, New York, Ohio, Texas, Tennessee, Georgia, and Colorado** have the most lightning deaths and injuries.

Preventive and Protective Measures

Prior to working in areas or beginning projects when or where there is an increased potential for lightning striking personnel, steps must be taken to predict the occurrence of lightning strikes. Recommendations include:

- Check with client management to determine if there are any patterns or noted conditions that can help predict lightning or if there are structures that are prone to lightning strikes. Arrange for

client notification when there is increased potential for lightning activities. Ensure that clients include WESTON workers in lightning contingency plans.

- Monitor weather reports.
- Note weather changes and conditions that produce lightning.
- Stop work in open areas, around drill rigs or other structures that may attract lightning, on or in water and in elevated work places when lightning strikes are sighted or thunder is heard near a work site.
- Ensure all personnel are provided with safe areas of refuge. Prevent personnel from standing in open areas, under lone trees, or under drill rigs.
- Observe the "30-30" Rule. If you see lightning and thunder is heard within 30 seconds (approximately 6 miles), seek shelter. If you hear thunder, but did not see the lightning, you can assume that lightning is within 6 miles and you should seek shelter. Remain in the sheltered location for 30 minutes following the last lightning strike.
- Use a hand held static potential meter (lightning detection device) to monitor the potential difference between a cloud and the ground. When the measured potential is greater than 2 kV/m, there is a potential for a lightning strike – seek shelter.

High Wind and Tornado Safety

High Winds

Many construction workers have died due to wind-related accidents and injuries. A ladder that seems secure under normal circumstances can become unstable during windy conditions and cause you to fall. Scaffolding that is improperly secured can rip free during strong winds and kill bystanders. The risk of injury for construction workers increases during strong winds. Keep in mind that changing weather conditions can affect your daily work tasks, and make sure you have a game plan to prevent proper damage and personal injury.

Stay Informed: With today's modern technology available at the touch of a button, you should keep up to date with the latest local weather reports. Visit weatherbug.com or weather.gov to stay informed in case of wind warnings, watches, and advisories. Larger projects may have their own weather station on site to provide instant weather data. Use daily hazard assessments to determine if working conditions have changed or will change throughout the day.

Be Prepared: When you know the weather will be windy, secure loose building materials, scaffolding and fencing that could be picked up or torn loose by strong winds and thrown onto surrounding streets, structures, vehicles, or bystanders.

Know the Limits of Your Equipment: When operating any equipment, take time to read the operator's manual and become familiar with the wind specifications. Many crane manufacturers have high-wind guidelines to prevent you from operating a crane in unsafe weather. You should also check safety equipment such as fall protection to determine if it is adequate for windy conditions.

Know the Terminology

Severe Thunderstorm Watch

A Severe Thunderstorm Watch means that strong thunderstorms capable of producing winds of 58 mph or higher and/or hail 3/4 inches in diameter or larger are possible. If you are in the area of a Severe Thunderstorm Watch, you should be prepared to take shelter from thunderstorms. Severe Thunderstorm Watches are generally issued for 6-hour periods.

Severe Thunderstorm Warning

A Severe Thunderstorm Warning means that thunderstorms capable of strong winds and/or large hail are occurring or could form at any time. If you are in the area of a severe thunderstorm, you should take shelter indoors immediately, avoid windows, and be prepared for high winds and hail. Severe Thunderstorm Warnings are generally in effect for an hour or less.

High Wind Watch

A High Wind Watch is issued when sustained winds exceeding 40 mph and/or frequent gusts over 60 mph are likely to develop in the next 24 to 48 hours. For summit areas, high wind watches are issued when sustained winds are expected to exceed 45 mph and/or frequently gust over 60 mph. If you are in an area for which a High Wind Watch has been issued you should secure loose objects outdoors that may blow about and avoid outdoor activity that exposes you to high winds.

High Wind Warning

A High Wind Warning is issued when sustained winds exceeding 40 mph and/or frequent gusts over 60 mph are occurring or imminent. For summit areas, warnings are issued for winds exceeding 45 mph and/or frequently gusting over 60 mph. Wind warnings may issued up to 24 hours ahead of the onset of high winds and remain in effect for 6 to 12 hours. If you are in an area where a high wind warning is in effect you should avoid activities that expose you to high winds. Loose objects may be blown around. Tree limbs may break and fall. Power lines may be blown down.

Wind Advisory

A Wind Advisory is issued when sustained winds of 30 to 39 mph and/or frequent gusts to 50 mph or greater are occurring or imminent. Wind advisories may be in effect for 6 to 12 hours. If you are in an area where a wind advisory is in effect you should secure loose objects that may be blown about outdoors and limit activity that may expose you to high winds.

Work Safely: If you will be working on a windy day, you should be alert and protected. Wear eye protection to prevent dust and other particles from entering or striking your eyes. Keep your hard hat on at all times to prevent injuries from falling or flying objects. The likelihood of falls from heights is greatly increased by strong winds. Wear the necessary PPE to ensure your safety.

To avoid flying debris and to minimize damage during high winds:

- Shut down outdoor activities involving work at elevation on ladders, scaffolding, aerial lifts, etc.; handling large tarps and plastic sheeting when wind speeds exceed 25 mph; including work with radioactive materials and highly toxic materials that could be dispersed by the winds.
- At 13 - 18 mph wind will raise dust. Follow the dust action level.

- Move mobile items stored outside to indoor storage.
- Secure any items that cannot be moved inside.
- Be careful opening exterior doors.
- Be cautious about downed power lines, tree limbs, and debris on roads.
- Be alert for animals who have escaped from farms and zoos.

Stay Away from Power Lines: High winds can cause tree limbs to fall on power lines resulting in electrocution hazards or loss of power. Your best bet is to keep your distance.

Tornados

What is a TORNADO?

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. It is spawned by a thunderstorm or as a result of severe weather associated with hurricanes. A funnel cloud is formed as cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado results from high wind velocity and wind blown debris.

Tornado Safety

When a tornado approaches, you have only a brief amount of time to make life-or-death decisions. Advance planning and quick response are the keys to surviving a tornado.

Purchase a NOAA Weather Alert radio with an alert feature. When tuned to the proper frequency, these weather radios remain silent until a weather emergency occurs. Once they pick up the alarm tone, they will begin broadcasting emergency weather information so that citizens can protect themselves and their property. Some models of the NOAA weather radio incorporate the Specific Area Message Encoder technology, allowing users to target only those warnings that affect their immediate geographic area.

Conduct tornado drills. Designate an area to serve as your safe area, and practice having team members assemble there in response to a mock tornado warning.

Emergency Communications Plan. Develop an emergency communications plan in case team members are separated from one another when a tornado warning goes into effect. Designate an emergency coordinator. Instruct everyone to contact this coordinator in a weather emergency for instructions on what to do during the storm and where to reassemble after the emergency has passed. Design contingency plans to be consistent with client contingency plans. When possible use client warning and alerting systems and confirm that team members have access to shelters and know how to get to them.

Know the Difference between a Tornado Watch and a Tornado Warning

Tornado Watch: Issued by the National Weather Service when tornadoes are possible in your area. You should remain alert for approaching storms. Remind family members of where the safe areas are within your home, and carefully monitor radio or television reports for further developments.

Tornado Warning: Indicates that a tornado has been sighted in your area, or is indicated on weather radar. You should proceed to safe shelter immediately.

When A Tornado Warning Goes In Effect, Put Your Safety Plans In Action.

In Your Automobile: Motor vehicles are easily overturned by tornado winds. Leave your vehicle and seek shelter in a sturdy building. As a last resort, seek shelter in a ditch or culvert. Do not try to outrun or outmaneuver a tornado! Use the time to seek appropriate shelter outside your vehicle.

Office Buildings, Hotels, and Shopping Centers: Take shelter in an interior hallway on a lower floor. A closet, bathroom or other small room with short, stout walls will give some protection from collapse and flying debris. Otherwise, get under heavy furniture and stay away from windows. Many tornado deaths have occurred in large buildings due to the collapse of a roof or wide span wall. A corner area, away from a window, is safer than the middle of a wide span wall.

Out In Open Country: When severe weather approaches, seek inside shelter immediately. The chances of encountering falling trees, downed power lines and lightning are far greater than encountering a tornado itself. If a tornado approaches, lie flat in the nearest depression, such as a culvert or ditch, and cover your head with your arms.

BE ALERT TO CHANGING WEATHER CONDITIONS

HAVE AN EMERGENCY WEATHER PLAN IN PLACE

REHEARSE YOUR CONTINGENCY PLANS PERIODICALLY

KNOW WHERE TO GO WHEN A TORNADO THREATENS.

ATTACHMENT C

FLD 06 – COLD STRESS

FLD 06 COLD STRESS

Three major factors that contribute to cold stress are cold temperatures, dampness, and wind velocity. Persons working outdoors in low temperatures, especially in wet or windy conditions, are subject to cold stress. Exposure to extreme cold for even a short time can cause severe injury to the surface of the body, or result in cooling of the body core temperature which, if unchecked, can be fatal. Site workers must learn to recognize and treat the various forms of cold stress.

RELATED FLDs

FLD 02 – Inclement Weather
FLD 17 – Diving
FLD 19 – Working Over or Near Water
FLD 25 – Working at Elevation/Fall Protection

GENERAL INFORMATION

Body heat is conserved through the constriction of surface blood vessels. This constriction reduces circulation at the skin layers and keeps blood nearer the body core. Loss of body heat can occur through:

1. Respiration – The process of breathing; inhaling and exhaling air. Heat is lost when breathing cold air into the lungs.
2. Evaporation – Heat loss from the body by vaporization of water from the skin surface.
3. Conduction – Direct transfer of body heat by contact with a cooler object. Conduction may occur when sitting on snow, touching cold equipment, and working in the rain. Body heat is lost rapidly when a person becomes wet. Most clothing loses approximately 90 percent of its insulating properties when wet. Additionally, water conducts heat 240 times faster than air; thus, the body cools suddenly when the layer of clothing that contacts the skin becomes wet.
4. Radiation – Heat radiated outward from the body to a cooler environment. The greatest amount of body heat is lost from uncovered surfaces of the body, especially the head, neck, and hands.
5. Convection – Heat transferred to cool air moving across the surface of the body. The body continually heats a thin layer of air next to the skin. Clothing retains this warm surface layer of air. If this warm air is removed by air currents (wind), the body will be cooled while attempting to rewarm the surface air. Wind chill is the chilling effect of moving air in combination with low temperature.

Other factors may contribute to cold stress, such as:

1. Medications, including antidepressants, sedatives, tranquilizers and some heart medications may affect the body's ability to thermo-regulate.
2. Dehydration, or the loss of body fluids, occurs in a cold environment and may increase the susceptibility of workers to cold injury due to a significant change in blood flow to the extremities.
3. Heavy work typically causes sweating that will result in wet clothing.

4. A worker's predisposing health condition such as cardiovascular disease, diabetes, and hypertension.
5. Older people are not able to generate heat as quickly, thus may be at more risk than younger adults.

When the body is unable to warm itself, serious cold-related illness and injuries may occur, including permanent tissue damage and possible death.

RECOGNITION AND RISK ASSESSMENT

In the planning stages of a project, the potential for cold-related hazards must be considered in the site-specific Health and Safety Plan (HASP) and during risk assessment. The Field Safety Officer (FSO) must make decisions on the proper safety procedures and recommend them to the site manager. Each worker must evaluate the risk associated with his or her work and be actively alert to these hazards. Any site worker may stop work if safety procedures are not followed or the risk is too great.

Low Temperature + Wind Speed + Wetness = Injuries and Illness

The Cold Stress Equation (OSHA Card-3156) is a quick-reference tool provided on the Weston Portal.

Frostbite

Frostbite is the freezing of tissue and most commonly affects the toes, ears, fingers, and face. Frostbite occurs when an extremity loses heat faster than it can be replaced by the circulating blood. Frostbite may result from direct exposure to extreme cold or cool, high wind. Damp socks and shoes may contribute to frostbite of the toes.

Signs and symptoms of frostbite include:

- Cold, tingling, aching, or stinging feeling followed by numbness
- Skin color is red, purple, white, or very pale and is cold to the touch
- Blisters may be present (in severe cases)

Treatment for frostbite:

- Call for emergency medical assistance.
- Move the victim indoors and/or away from additional exposure to cold, wet, and wind.
- Wrap the affected area in a soft, clean cloth (sterile, if available).
- Give a warm drink (water or juices, not coffee, tea or alcohol). Do not allow the victim to smoke.
- Do not rub the frostbitten part (this may cause gangrene).
- Do not use ice, snow, gasoline or anything cold on the frostbitten area.
- Do not use heat lamps or hot water bottles to rewarm the frostbitten area.
- Do not place the frostbitten area near a hot stove.
- Do not break blisters.
- After rewarming, elevate the area and protect it from further injury.

Hypothermia

Hypothermia means "low heat" and is a potentially serious condition. Systemic hypothermia occurs when body heat loss exceeds body heat gain and the body core temperature falls below the normal 98.6°F. While some hypothermia cases are caused by extremely cold temperatures, most cases develop in air

temperatures between 30° and 50°F, especially when compounded with water immersion and/or windy conditions.

The victim of hypothermia may not know, or refuse to admit, that he or she is experiencing hypothermia. All personnel must be observant for these signs for themselves and for other team members. Hypothermia can include one or more of the following symptoms.

- Cool bluish skin
- Uncontrollable shivering
- Vague, slow, slurred speech
- Irritable, irrational, or confused behavior
- Memory lapses
- Clumsy movements, fumbling hands
- Fatigue or drowsiness

Below the critical body core temperature of 95°F, the body cannot produce enough heat by itself to recover. At this point, emergency measures must be taken to reverse the drop in core temperature. The victim may slip into unconsciousness and can die in less than 2 hours after the first signs of hypothermia are detected. Treatment and medical assistance are critical.

Treatment for hypothermia:

- Call for emergency medical assistance.
- Do not leave the victim alone.
- Prevent further heat loss by moving the person to a warmer location out of the wind, wet, and cold.
- Remove cold, wet clothing and replace with warm dry clothing or wrap the victim in blankets.
- If the victim is conscious, provide warm liquids, candy, or sweetened foods. Carbohydrates are the food most quickly transformed into heat and energy. Do not give the victim alcohol or caffeine.
- Have the person move their arms and legs to create muscle heat. If they are unable to move, place warm bottles or hot packs in the arm pits, groin, neck, and head. Do not rub the arms and legs or place the person in warm water.

Prevention and Protection

The following general guidelines are recommended for preventing or minimizing cold stress:

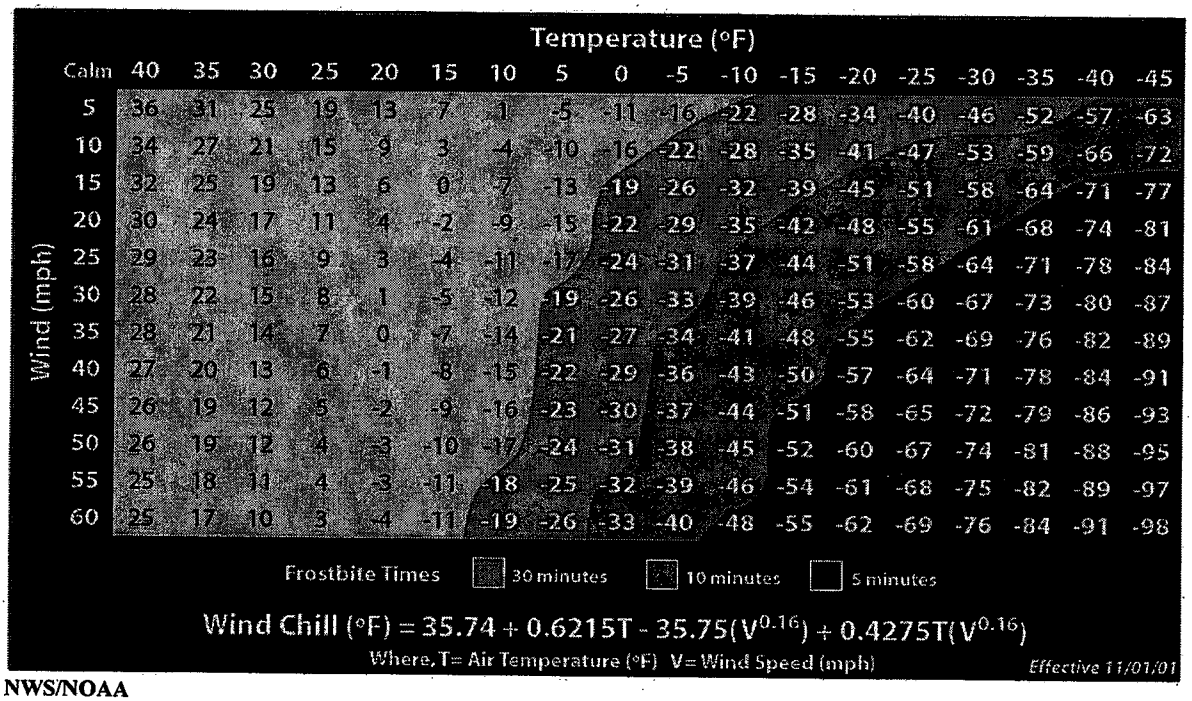
- Wear loose, layered clothing, masks, woolen scarves, and hats. Wear liners under hard hats
- Protect hands with gloves or mittens.
- Never touch cold metal with bare hands.
- Wear waterproof, slip-resistant, insulated boots
- Use chemical foot and hand warmers (commercially available) inside boots and gloves.
- In extreme cold, cover the mouth and nose with wool or fur to "pre-warm" the air you breathe.
- If wearing a face protector, remove it periodically to check for frostbite.

- Ensure that clothing remains secure around the body, especially at the neck and waist.
- If required to wear chemical protective clothing, remember that it generally does not afford protection against cold stress. In many instances, chemical protective clothing increases susceptibility. Dress carefully if both chemical protection and thermal insulation are required.
- Remove outer layers to avoid overheating and soaking clothing with perspiration; replace layers to avoid becoming chilled.
- Keep clothes dry by wearing water-resistant and wind-resistant clothing and outerwear.
- Wear clothing that will "breathe" or allow water vapor to escape.
- Eat well-balanced meals, ensure adequate intake of liquids and avoid alcoholic beverages. Drink warm sweet beverages and soups. Limit the intake of caffeinated drinks due to the diuretic and circulatory effects.
- Utilize available warm shelters and implement work-rest schedules.
- If warm shelters are not available, use cars/vehicles as shelter from the cold. (Ensure that tailpipes are not covered by heavy snowfall).
- Use radiant heaters to provide warmth (if using propane heaters ensure adequate ventilation to avoid carbon monoxide poisoning).
- Monitor yourself and others for changes in physical and mental condition.
- Use the buddy system or supervision to ensure constant protective observation.
- If heavy work must be done, resulting in sweating/wet clothing, take rest periods in heated shelters and change into dry clothing as necessary.
- New employees should not work full-time in the cold during the first days of employment until they become accustomed to the working conditions and the use of required protective clothing.
- Include the weight and bulkiness of clothing in estimating the required work performance and weights to be lifted by the worker.
- Arrange the work in such a way that sitting or standing still for long periods is minimized.
- Perform work protected from drafts to the greatest extent possible. If possible, shield the work area from wind.
- Instruct workers in safety and health procedures. The training program should include, as a minimum, instruction in:
  - Signs and symptoms of frostbite, impending hypothermia, or excessive cooling of the body
  - Proper use of clothing
  - Proper eating and drinking habits
  - Safe work practices
  - Proper rewarming procedures and appropriate first aid treatment
- Tables 1 and 2 should be consulted to adjust working schedules for wind chill conditions based on equivalent chill temperature (ECT). These tables are guidelines only; ambient temperatures and wind conditions should be monitored frequently and work schedules adjusted as required. If workers show signs or symptoms of cold stress, the work schedule must be adjusted, as required.

Work/Warming Regimen

Work should be performed in the warmest part of the day. If work is performed continuously in the cold or winter conditions or where rain or cool winds are expected, provide heated warming shelters, tents, cabins, or break rooms nearby. Encourage workers to use the shelter at regular intervals depending on the severity of the cold exposure. Table 2, Cold Work/Warmup Schedule for 4-Hour Shifts, provides guidance for working in severe cold weather. The onset of heavy shivering, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter. Pain, numbness, or tingling in the extremities are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation, or the worker should change into dry clothing. Never return to work in wet clothing.

Table 1. Wind Chill Chart



NWS/NOAA

Table 2. Cold Work/Warmup Schedule for 4-Hour Shifts

EQUIVALENT CHILL TEMPERATURE	MAXIMUM WORK PERIOD	NO. OF BREAKS
≥-24°F	Normal	1
-25° to –30°F	75 minutes	2
-31° to –35°F	55 minutes	3
-36° to –40°F	40 minutes	4
-41° to –45°F	30 minutes	5
≤-46°F	Stop work	Stop work

ATTACHMENT D

FLD 22 – EARTH MOVING EQUIPMENT/MATERIAL HANDLING EQUIPMENT

FLD 22 EARTH MOVING EQUIPMENT/MATERIAL HANDLING EQUIPMENT

REFERENCES

29 CFR Part 1926 Subparts 600-602

RELATED FLDs

FLD 23 – Cranes, Rigging, and Slings
FLD 24 – Aerial Lifts/Manlifts
FLD 34 – Utilities
FLD 35 – Electrical Safety

PROCEDURE

These rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment.

Machinery and Mechanized Equipment Safety

Before any machinery or mechanized equipment is placed in use, it will be inspected and tested by a competent mechanic and certified to be in safe operating condition.

WESTON will designate a competent person to be responsible for the inspection of all machinery and equipment daily and during use to make sure it is in safe operating condition. Tests will be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition.

Preventative maintenance procedures recommended by the manufacturer will be followed.

Any machinery or equipment found to be unsafe shall be removed from service and its use prohibited until unsafe conditions have been repaired or corrected.

Inspections or determinations of road conditions and structures will be made in advance to ensure that clearances and load capacities are safe for the passing or placement of any machinery or equipment.

Machinery and mechanized equipment will be operated only by designated personnel. Equipment deficiencies observed at any time that affect safe operation will be corrected before continuing operation.

Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers (J386-1969) and Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers (J333a-1970), Operator Protection for Agricultural and Light Industrial Tractors.

Seat belts shall be worn when provided by the manufacturer. Passengers shall not be allowed to ride on equipment unless equipment is designed with additional seats with safety belts.

Audible alarms. All bi-directional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

Getting off or on any equipment while it is in motion is prohibited.

Machinery or equipment requiring an operator will not be permitted to run unattended.

Machinery or equipment will not be operated in a manner that will endanger persons or property, nor will the safe operating speeds or loads be exceeded.

All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. The only exemption is equipment designed to be serviced or maintained while running.

All repairs on machinery or equipment will be made at a location that will provide protection from traffic or other hazards to maintenance personnel.

Machinery and equipment, or parts thereof, that are suspended or held apart by slings, hoists, or jacks also will be substantially blocked or cribbed before personnel are permitted to work underneath or between them.

Bulldozer and scraper blades, front end-loader buckets, dump bodies, and similar equipment will be either fully lowered or blocked when being repaired or when not in use. All controls will be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.

Stationary machinery and equipment will be placed on a firm foundation and secured before being operated.

All points requiring lubrication during operation will have fittings so located or guarded to be accessible without hazardous exposure.

When necessary, all mobile equipment and the operating area will be adequately illuminated while work is in progress.

Mechanized equipment will be shut down prior to and during fueling operations. Closed systems, with automatic shutoff that will prevent spillage if connections are broken, may be used to fuel diesel powered equipment left running.

All towing devices used on any combinations of equipment will be securely mounted and structurally adequate for the weight drawn.

Persons will not be permitted to get between a piece of towing equipment and the item being towed until the towing equipment has come to a complete stop.

All equipment with windshields will be equipped with powered wipers. Vehicles that operate under conditions that cause fogging or frosting of windshields will be equipped with operable defogging or defrosting devices.

All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, will have lights or reflectors, or barricades equipped with lights or reflectors, to identify the location of the equipment.

Whenever the equipment is parked, the parking brake will be set. Equipment parked on inclines will have the wheels chocked or track mechanism blocked and the parking brake set. Equipment such as lift trucks and stackers will have the rated capacity posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also will be clearly shown on the vehicle. The ratings will not be exceeded.

Steering or spinner knobs will not be attached to the steering wheel unless the steering mechanism prevents road reactions from causing the steering hand wheel to spin. When permitted, the steering knob will be mounted within the periphery of the wheel.

All industrial trucks in use will meet the requirements of design, construction, stability, inspection, testing, maintenance, and operation, defined in American National Standards Institute (ANSI) B56.1, Safety Standards for Powered Industrial Trucks.

The installation of live booms on material and personnel hoists is prohibited.

The controls of loaders, excavators, or similar equipment with folding booms or lift arms will not be operated from a ground position unless so designed.

Personnel will not work or pass under the buckets or booms of loaders in operation.

Cranes and any other equipment used for lifting must be inspected as required and records of inspection must be maintained.

Drill Rigs

See FLD 56, *Drilling Safety*

ATTACHMENT E

NIOSH CHEMICAL GUIDES

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Se

Zinc oxide

CAS 1314-13-2

ZnO

RTECS ZH481

Synonyms & Trade Names
Zinc peroxide

DOT ID & Gu
1516 143

Exposure Limits

NIOSH REL: Dust: TWA 5 mg/m^3 C 15 mg/m^3
Fume: TWA 5 mg/m^3 ST 10 mg/m^3

OSHA PEL†: TWA 5 mg/m^3 (fume) TWA 15 mg/m^3 (total dust) TWA 5 mg/m^3 (resp d

IDLH 500 mg/m^3 See: 1314132

Conversion

Physical Description
White, odorless solid.

MW: 81.4	BP: ?	MLT: 3587°F	Sol(64°F): 0.000
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.61
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities
Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]

Measurement Methods
NIOSH 7303, 7502; OSHA ID121, ID143
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: No recommendation
Eyes: No recommendation
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation

First Aid (See procedures)

Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering face quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for inform selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.

Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on sel or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode

(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positi mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on sel or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation

Symptoms Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breatl rales, decreased pulmonary function

Target Organs respiratory system

See also: INTRODUCTION See ICSC CARD: 0208 See MEDICAL TESTS: 0246

NIOSH Home | NIOSH Search | Site Index | Topic List | Contact Us

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Se

Hydrogen chloride

CAS 7647-01-0

HCl

RTECS MW40

Synonyms & Trade Names
Anhydrous hydrogen chloride; Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid) [Note: Often used in an aqueous solution.]

DOT ID & Gu
1050 125 (anhyc
1789 157 (solutic

Exposure Limits	
	NIOSH REL: C 5 ppm (7 mg/m^3)
	OSHA PEL: C 5 ppm (7 mg/m^3)

IDLH 50 ppm See: 7647010

Conversion 1 ppm = 1.49 mg/m^3

Physical Description
Colorless to slightly yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]

MW: 36.5	BP: -121°F	FRZ: -174°F	Sol(86°F): 67%
VP: 40.5 atm	IP: 12.74 eV	RGasD: 1.27	
Fl.P: NA	UEL: NA	LEL: NA	

Nonflammable Gas

Incompatibilities & Reactivities
Hydroxides, amines, alkalis, copper, brass, zinc [Note: Hydrochloric acid is highly corrosive to most metals.]

Measurement Methods
NIOSH 7903; OSHA ID174SG
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact (solution)/Frostbite
Eyes: Prevent eye contact/Frostbite
Wash skin: When contaminated (solution)
Remove: When wet or contaminated (solution)
Change: No recommendation
Provide: Eyewash (solution), Quick drench (solution), Frostbite wash

First Aid (See procedures)
Eye: Irrigate immediately (solution)/Frostbite
Skin: Water flush immediately (solution)/Frostbite
Breathing: Respiratory support
Swallow: Medical attention immediately (solution)

Respirator Recommendations NIOSH/OSHA
Up to 50 ppm:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern*
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister provid against the compound of concern
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positiv mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canist
appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion (solution), skin and/or eye contact

Symptoms Irritation nose, throat, larynx; cough, choking; dermatitis; solution: eye, skin burns; liquid: frostbite; in anima
spasm; pulmonary edema

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION See ICSC CARD: 0163 See MEDICAL TESTS: 0116

NIOSH Home | NIOSH Search | Site Index | Topic List | Contact Us

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Se

Trichloroethylene

CAS 79-01-6

$ClCH=CCl_2$

RTECS KX455

Synonyms & Trade Names
Ethylene trichloride, TCE, Trichloroethene, Trilene

DOT ID & Gu
1710 160

Exposure Limits

NIOSH REL: Ca See Appendix A See Appendix C

OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 h

IDLH Ca [1000 ppm] See: 79016

Conversion 1 ppm = 5.37 mg/m^3

Physical Description
Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW: 131.4	BP: 189°F	FRZ: -99°F	Sol(77°F): 0.1%
VP: 58 mmHg	IP: 9.45 eV		Sp.Gr: 1.46
Fl.P: ?	UEL(77°F): 10.5%	LEL(77°F): 8%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities
Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Measurement Methods
NIOSH 1022, 3800; OSHA 1001
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positi mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, dr nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION See ICSC CARD: 0081 See MEDICAL TESTS: 0236

NIOSH Home | NIOSH Search | Site Index | Topic List | Contact Us

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Se

Sodium hydroxide

CAS 1310-73-2

NaOH

RTECS WB49(

Synonyms & Trade Names
Caustic soda, Lye, Soda lye, Sodium hydrate

DOT ID & Gu
1823 154 (dry, s
1824 154 (soluti

Exposure Limits	
	NIOSH REL: C 2 mg/m^3
	OSHA PEL†: TWA 2 mg/m^3

IDLH 10 mg/m^3 See: 1310732

Conversion

Physical Description
Colorless to white, odorless solid (flakes, beads, granular form).

MW: 40.0	BP: 2534°F	MLT: 605°F	Sol: 111%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 2.13
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials.

Incompatibilities & Reactivities
Water; acids; flammable liquids; organic halogens; metals such as aluminum, tin & zinc; nitromethane [Note: Corrosive tc

Measurement Methods
NIOSH 7401
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Water flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA

Up to 10 mg/m^3:

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode£
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on sel or P filters.
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.£
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positi mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on sel
or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms Irritation eyes, skin, mucous membrane; pneumonitis; eye, skin burns; temporary loss of hair

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION See ICSC CARD: 0360 See MEDICAL TESTS: 0210

NIOSH Home | NIOSH Search | Site Index | Topic List | Contact Us

NIOSH Publication 2005-149

NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Se

Ammonia

CAS 7664-41-7

NH_3

RTECS BO087

Synonyms & Trade Names
Anhydrous ammonia, Aqua ammonia, Aqueous ammonia [Note: Often used in an aqueous solution.]

DOT ID & Gu
1005 125 (anhyc
2672 154 (10-35
2073 125 (>35-5
1005 125 (>50%

Exposure Limits	**NIOSH REL**: TWA 25 ppm (18 mg/m^3) ST 35 ppm (27 mg/m^3)
	OSHA PEL†: TWA 50 ppm (35 mg/m^3)

IDLH 300 ppm See: 7664417

Conversion 1 ppm = 0.70 mg/m^3

Physical Description
Colorless gas with a pungent, suffocating odor. [Note: Shipped as a liquefied compressed gas. Easily liquefied under pre

MW: 17.0	BP: -28°F	FRZ: -108°F	Sol: 34%
VP: 8.5 atm	IP: 10.18 eV	RGasD: 0.60	
Fl.P: NA (Gas)	UEL: 28%	LEL: 15%	

[Note: Although NH_3 does not meet the DOT definition of a Flammable Gas (for labeling purposes), it should be treated a

Incompatibilities & Reactivities
Strong oxidizers, acids, halogens, salts of silver & zinc [Note: Corrosive to copper & galvanized surfaces.]

Measurement Methods
NIOSH 3800, 6015, 6016; OSHA ID188
See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated (solution)
Remove: When wet or contaminated (solution)
Change: No recommendation
Provide: Eyewash (>10%), Quick drench (>10%)

First Aid (See procedures)
Eye: Irrigate immediately (solution/liquid)
Skin: Water flush immediately (solution/liquid)
Breathing: Respiratory support
Swallow: Medical attention immediately (solution)

Respirator Recommendations NIOSH
Up to 250 ppm:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern*
(APF = 10) Any supplied-air respirator*
Up to 300 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern*
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compc
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister provid against the compound of concern
(APF = 50) Any self-contained breathing apparatus with a full facepiece

(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand o pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positi mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister provid against the compound of concern/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes inhalation, ingestion (solution), skin and/or eye contact (solution/liquid)

Symptoms Irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink fr skin burns, vesiculation; liquid: frostbite

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION See ICSC CARD: 0414 See MEDICAL TESTS: 0013

NIOSH Home | NIOSH Search | Site Index | Topic List | Contact Us

Chemical Datasheet

SODIUM NITRITE

Chemical Identifiers | Hazards | Response Recommendations | Physical Properties | Regulatory Information | Alternate Chemical Names

Chemical Identifiers

What is this information?

UN/NA Number	CAS Number	CHRIS Code	DOT Hazard Label
1500	7632-00-0	SNT	OXIDIZER

NFPA 704: data unavailable

General Description

A yellowish white crystalline solid. Noncombustible but will accelerate the burning of combustible material. If large quantities are involved in a fire or if the combustible material is finely divided, an explosion may result. If contaminated by ammonium compounds, spontaneous decomposition can occur and the resulting heat may ignite surrounding combustible material. Prolonged exposure heat may result in an explosion. Toxic oxides of nitrogen are produced in fires involving this material. Used as a food preservative, and to make other chemicals.

Hazards

What is this information?

Reactivity Alerts

Strong Oxidizing Agent

Air & Water Reactions

Soluble in water.

Fire Hazard

Special Hazards of Combustion Products: Toxic oxides of nitrogen may form in fires.

Behavior in Fire: May increase intensity of fire if in contact with combustible material. May melt and flow at elevated temperatures. (USCG, 1999)

Health Hazard

Ingestion (or inhalation of excessive amounts of dust) causes rapid drop in blood pressure, persistent and throbbing headache, vertigo, palpitations, and visual disturbances; skin becomes flushed and sweaty, later cold and cyanotic; other symptoms include nausea, vomiting, diarrhea (sometimes), fainting, methemoglobinemia. Contact with eyes causes irritation. (USCG, 1999)

Reactivity Profile

SODIUM NITRITE is an oxidizing agent. Mixtures with phosphorus, tin(II) chloride or other reducing agents may react explosively [Bretherick 1979 p. 108-109]. If contaminated by ammonium compounds, spontaneous decomposition can occur and resulting heat may ignite surrounding combustible material. Reacts with acids to form toxic nitrogen dioxide gas. Mixing with liquid ammonia forms dipotassium nitrite, which is very reactive and easily explosive [Mellor 2, Supp. 3:1566 1963]. Melting together with an ammonium salt leads to a violent explosion [Von Schwartz 1918 p. 299]. A mixture with potassium cyanide may cause an

explosion. Noncombustible but accelerates the burning of all combustible material. If large quantities are involved in fire or if the combustible material is finely divided, an explosion may result. When a little ammonium sulfate is added to fused potassium nitrite, a vigorous reaction occurs attended by flame [Mellor 2:702. 1946-47].

Belongs to the Following Reactive Group(s)

- Inorganic Oxidizing Agents

Response Recommendations

What is this information?

Firefighting

Flood with water. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. (AAR, 2003)

Non-Fire Response

Keep sparks, flames, and other sources of ignition away. Keep material out of water sources and sewers. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting water. Water spill: Add soda ash (Na2CO3). Add calcium hypochlorite (Ca(ClO)2). Adjust pH to neutral (pH=7). (AAR, 2003)

Protective Clothing

Dust mask; goggles or face shield; protective gloves (USCG, 1999)

First Aid

EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. IMMEDIATELY call a physician and be prepared to transport the victim to a hospital even if no symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

INGESTION: If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. Generally, the induction of vomiting is NOT recommended outside of a physician's care due to the risk of aspirating the chemical into the victim's lungs. However, if the victim is conscious and not convulsing and if medical help is not readily available, consider the risk of inducing vomiting because of the high toxicity of the chemical ingested. Ipecac syrup or salt water may be used in such an emergency. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

Physical Properties

What is this information?

Molecular Formula: NO2.Na

Flash Point: data unavailable

Lower Explosive Limit: data unavailable

Upper Explosive Limit: data unavailable

Autoignition Temperature: 1000.0 ° F (NTP, 1992)

Melting Point: 520.0 ° F (NTP, 1992)

Vapor Pressure: data unavailable

Vapor Density: data unavailable

Specific Gravity: 2.17 at 68.0 ° F (USCG, 1999)

Boiling Point: Decomposes at 608° F (NTP, 1992)

Molecular Weight: 69.0 (NTP, 1992)

Water Solubility: greater than or equal to 100 mg/mL at 66° F (NTP, 1992)

AEGL: data unavailable

ERPG: data unavailable

TEEL-1	TEEL-2	TEEL-3
0.15 mg/m3 (SCAPA, 2008)	1.0 mg/m3	60.0 mg/m3

IDLH: data unavailable

Regulatory Information

What is this information?

Regulatory Names: SODIUM NITRITE

CAA RMP: Not a regulated chemical.

CERCLA: Regulated chemical with a Reportable Quantity of 100 pounds.

EHS (EPCRA 302): Not a regulated chemical.

TRI (EPCRA 313): Regulated chemical.

RCRA Chemical Code: none

Alternate Chemical Names

What is this information?

- ANTI-RUST
- DIAZOTING SALTS
- ECRINITRIT
- ERINITRIT
- FILMERINE
- NCI-C0284
- NITRITE DE SODIUM (DOT FRENCH)
- NITRITO DE SODIO (DOT SPANISH)
- NITROUS ACID SODIUM SALT (1:1)
- NITROUS ACID, SODIUM SALT
- SODIUM NITRITE (NANO2)
- SYNFAT 1004

SODIUM NITRITE

SNT

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Solid	White	Odorless
Eorinitrit Filmerine	Sinks and mixes with water.		

Keep people away. Avoid contact with solid and dust.
Shut off ignition sources and call fire department.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

Not flammable.
Will increase the intensity of a fire.
May cause fire on contact with combustibles.
POISONOUS GASES MAY BE PRODUCED IN FIRE.
Wear goggles and self contained breathing apparatus.
Flood discharge area with water.

Exposure

CALL FOR MEDICAL AID.
DUST
Irritating to eyes, nose and throat.
If inhaled will cause headache, difficult breathing, or loss of consciousness.
If in eyes, hold eyelids open and flush with plenty of water.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

SOLID
POISONOUS IF SWALLOWED.
Irritating to skin and eyes.
If swallowed will cause headache, nausea, vomiting or loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: $NaNO_2$
2.3 IMO/UN Designation: 5.1/1500
2.4 DOT ID No.: 1500
2.5 CAS Registry No.: 7632-00-0
2.6 NAERG Guide No.: 140
2.7 Standard Industrial Trade Classification: 52351

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Dust mask; goggles or face shield; protective gloves
3.2 Symptoms Following Exposure: Ingestion (or inhalation of excessive amounts of dust) causes rapid drop in blood pressure, persistent and throbbing headache, vertigo, palpitations, and visual disturbances; skin becomes flushed and sweaty, later cold and cyanotic; other symptoms include nausea, vomiting, diarrhea (sometimes), fainting, methemoglobinemia. Contact with eyes causes irritation.
3.3 Treatment of Exposure: INHALATION: move to fresh air; if exposure is severe, get medical attention. INGESTION: keep patient recumbent in a shock position and comfortably warm; administer gastric lavage; consult a physician. EYES or SKIN: flush with water.
3.4 TLV-TWA: Not listed.
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 3; LD_{50} = 50-500 mg/kg
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Currently not available
3.11 Liquid or Solid Characteristics: Currently not available
3.12 Odor Threshold: Currently not available
3.13 IDLH Value: Not listed.
3.14 OSHA PEL-TWA: Not listed.
3.15 OSHA PEL-STEL: Not listed.
3.16 OSHA PEL-Ceiling: Not listed.
3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

4.1 Flash Point: Not flammable, but may intensify fire
4.2 Flammable Limits in Air: Not flammable
4.3 Fire Extinguishing Agents: Apply plenty of water to adjacent fires. Cool exposed containers with water.
4.4 Fire Extinguishing Agents Not to Be Used: Currently not available
4.5 Special Hazards of Combustion Products: Toxic oxides of nitrogen may form in fires.
4.6 Behavior in Fire: May increase intensity of fire if in contact with combustible material. May melt and flow at elevated temperatures.
4.7 Auto Ignition Temperature: Not pertinent
4.8 Electrical Hazards: Not pertinent
4.9 Burning Rate: Not pertinent
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: Not pertinent.
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): Not pertinent.
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: No reaction
5.2 Reactivity with Common Materials: Currently not available
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Not pertinent
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: 17.1 ppm/24 hr/minnow/no effect/fresh water
7.5 ppm/48 hr/mosquitofish/TL_m/fresh water
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): Currently not available
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile: Not listed

7. SHIPPING INFORMATION

7.1 Grades of Purity: USP; Reagent
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Open
7.5 IMO Pollution Category: Currently not available
7.6 Ship Type: Currently not available
7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Oxidizer
8.2 49 CFR Class: 5.1
8.3 49 CFR Package Group: III
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification: Not listed
8.6 EPA Reportable Quantity: 100 pounds
8.7 EPA Pollution Category: B
8.8 RCRA Waste Number: Not listed
8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15° C and 1 atm: Solid
9.2 Molecular Weight: 69
9.3 Boiling Point at 1 atm: (decomposes) >608°F = >320°C = >593°K
9.4 Freezing Point: 520°F = 271°C = 544°K
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 2.17 at 20°C (solid)
9.8 Liquid Surface Tension: Not pertinent
9.9 Liquid Water Interfacial Tension: Not pertinent
9.10 Vapor (Gas) Specific Gravity: Not pertinent
9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
9.12 Latent Heat of Vaporization: Not pertinent
9.13 Heat of Combustion: Not pertinent
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Not pertinent
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: Currently not available

NOTES

SODIUM NITRITE

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
	NOT PERTINENT		NOT PERTINENT		NOT PERTINENT		NOT PERTINENT

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
34	77.919		NOT PERTINENT		NOT PERTINENT		NOT PERTINENT
36	78.240						
38	78.570						
40	78.889						
42	79.209						
44	79.530						
46	79.849						
48	80.179						
50	80.500						
52	80.820						
54	81.139						
56	81.469						
58	81.790						
60	82.110						
62	82.429						
64	82.750						
66	83.080						
68	83.400						
70	83.719						
72	84.040						
74	84.370						
76	84.690						
78	85.009						
80	85.330						
82	85.650						
84	85.980						